RESEARCH NOTES

TWO NEW SPECIES OF THE GENUS *PSEUDOSCHOENGASTIA* (ACARINA, TROMBICULIDAE) FROM MEXICO

Chiggers of the genus *Pseudoschoengastia* Lipovsky (1951) occur throughout North America, from Kansas and Nevada southward into Venezuela (Brennan and Reed, 1975). They are common in Costa Rica where 13 species are known (Geest and Loomis, 1968) and in Mexico where 14 species are reported, including the new species described below.

Each description of the larval stage is based on the holotype and paratypes (noted in parentheses) with all measurements in microns. The types are in the chigger research collection, California State University, Long Beach, and paratypes will be distributed to appropriate institutions and individuals.

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Pseudoschoengastia bisetosa, new species
Figure 1

Types.—Holotype and 121 paratypes from La Laguna, Baja California Sur, Mexico, 1670 m, July 9, 1967, from 11 *Peromyscus truei lagunae* Osgood (Piñon Mouse), taken by R. M. Davis, E. M. Fisher and L. M. Robbins: holotype and 12 paratypes with original number RMD670709-37.

Diagnosis.—Larva, in subgenus *Pseudoschoengastia*, with PLs off scutum, and in *farneri* group with 2 genualae I, short ALs, and short legs; but differing from all other species in having at least 2 branched setae on coxa II and III.

Description of holotype (with differences among paratypes listed in parentheses).—Idiosoma whitish, elongate, engorged 450 × 300; eyes red, 1/1 on ocular plate. Dorsal setal formula 4 (humerals)–6 (lateral humerals)–12(12–14)–8–10–12–10+20, total 80 (80–84); humerals 37, 1st posthumeral 26, posterior dorsal seta measuring 28. Ventral setal formula 2–2 (sternals) –4 (lateral sternals) +50 (preanals) +30 (postanals), total 90 (88–92); 1st sternals 33, posterior ventral seta measuring 27. Total idiosomal setae 160 (158–166).

Scutum: rectangular with posterior margin rounded, PLs off scutum; few scattered puncta; sensilla expanded (see fig. 1). Scutal measurements (in parentheses, mean and range of 10 types); AW 47 (46.1, 44–48), PW 68 (69, 64–76), SB 17 (17.9, 17–19), ASB 20 (19.7, 18–21), PSB 18 (17.7, 16–19), AP 33 (31.9, 30–35), AM 28 (27.1, 26–28), AL 22 (21.9, 20–32), PL 38 (37, 36–39), S 31 (32.2, 31–35) × 13 (12.5, 12–13).

Gnathosoma: chela with tricuspid cap and ventral tooth; chelobase and capitular sternum sparsely punctate. Galeala B. Palpal setal formula B/B/BBB; palpal tarsus 5B, T (8μ), palpotibial claw trifurcate.

Legs: I, 2, genualae, tarsala 17 (16.8, 16–18), sub- and parasubterminala; II, coxa 2B, genuala, 2 tibialae, tarsala 15 (14.9, 14–16), pretarsala; III, coxa 2–3B (2–2 in 93 percent of 122 types), genuala, tibiala, no mastisetae. All legs short: I 222, II 186, III 216, total index 624; segments 7–6–6 (femora fused, with 3 internal bars, and suture distinct) terminating in 2 claws and clawlike empodium without onychotriches.

Taxonomic remarks.—This species belongs to the *farneri* group and seems most closely similar to *P. aeci* Brennan (1965) of Nevada (and California), *P. occidentalis* Brennan (1952) of California, and *P. pedregalensis* (Hoffmann) of the Mexican plateau. They share most characteristics and in addition, the first two species have additional sternal setae (more than 2–2) which seem to be correlated with the extra coxal setae of *P. bisetosa*.

Ecological notes.—With one exception, all larvae were found deep within the ears (external auditory meatus) of two species of cricetine mice, *Peromyscus eva* and *P. truei*. More than half of the described species of *Pseudoschoengastia* are closely associated with one or several species of *Peromyscus*. This new species seems restricted to the Cape region of Baja California as it was absent from numerous collections of chiggers from *Peromyscus* and other rodents taken in central and northern parts of the peninsula.

Specimens examined (139).—*MEXICO*. BAJA CALIFORNIA SUR. El Chorro, *Peromyscus eva*, 29.X.1968 (2); 11 km W Santiago, *P. eva*, 31.X.1968 (2); La Burrera, 2 *P. eva*, 6.VII.1967 (6); La Laguna, 11 *Peromyscus truei*, 9.VII.1967 (122); 3.2 km S San Antonio, 29.VI.1967, *P. eva* (4), *Perognathus spinatus* (1).

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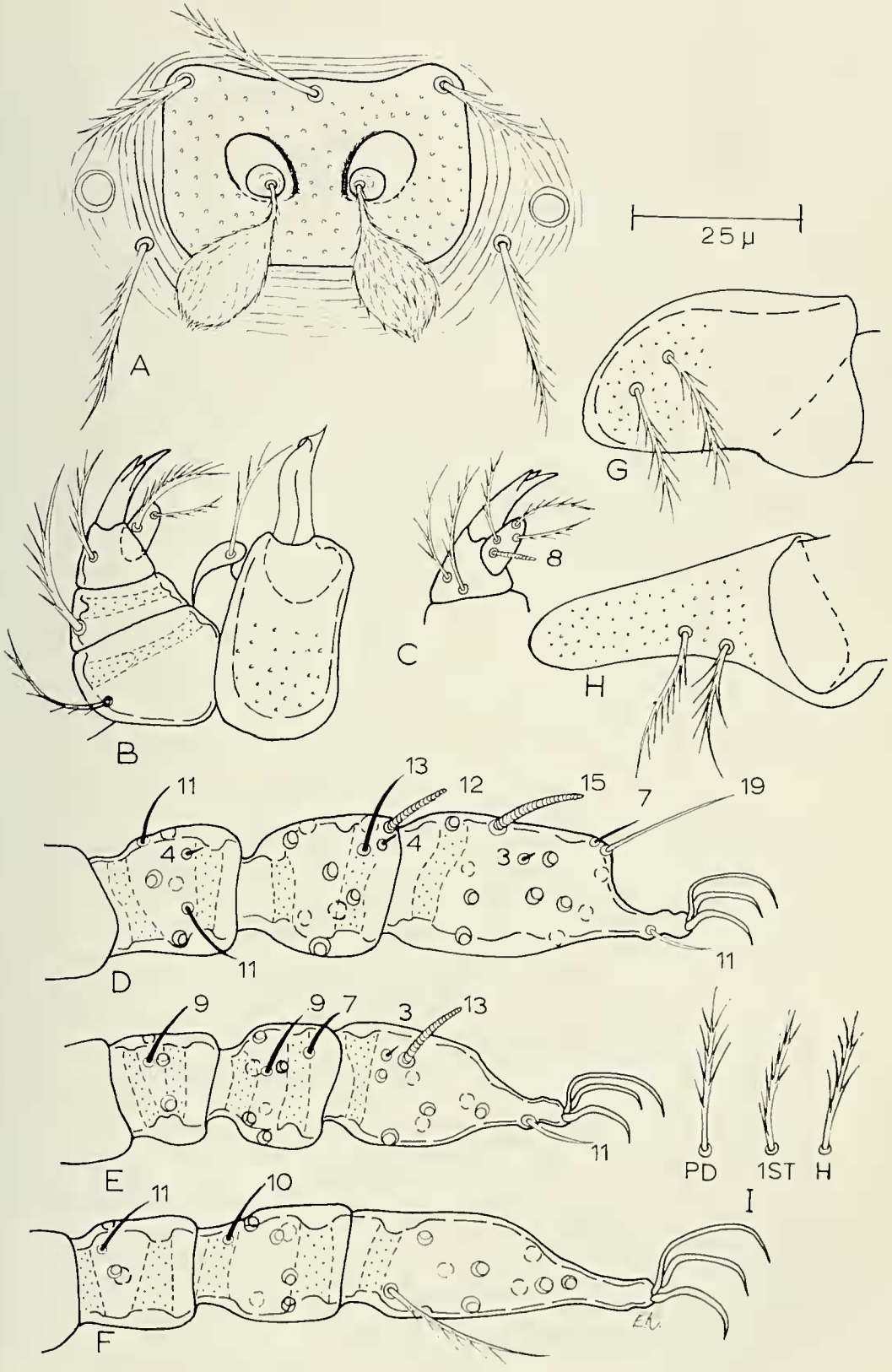
Figure 1. Larva of *Pseudoschoengastia bisetosa*. A. Scutum and eyes; B. Gnathosoma, dorsal aspect; C. Palpal tibia and tarsus, ventral view; D. Leg I, genu, tibia, and tarsus, with nude setae and measurements; E. Leg II, as above; F. Leg III, as above; G. Coxa III; H. Coxa II; I. Idiosomal setae, PD, posterior dorsal, 1st, first sternal, and H, humeral.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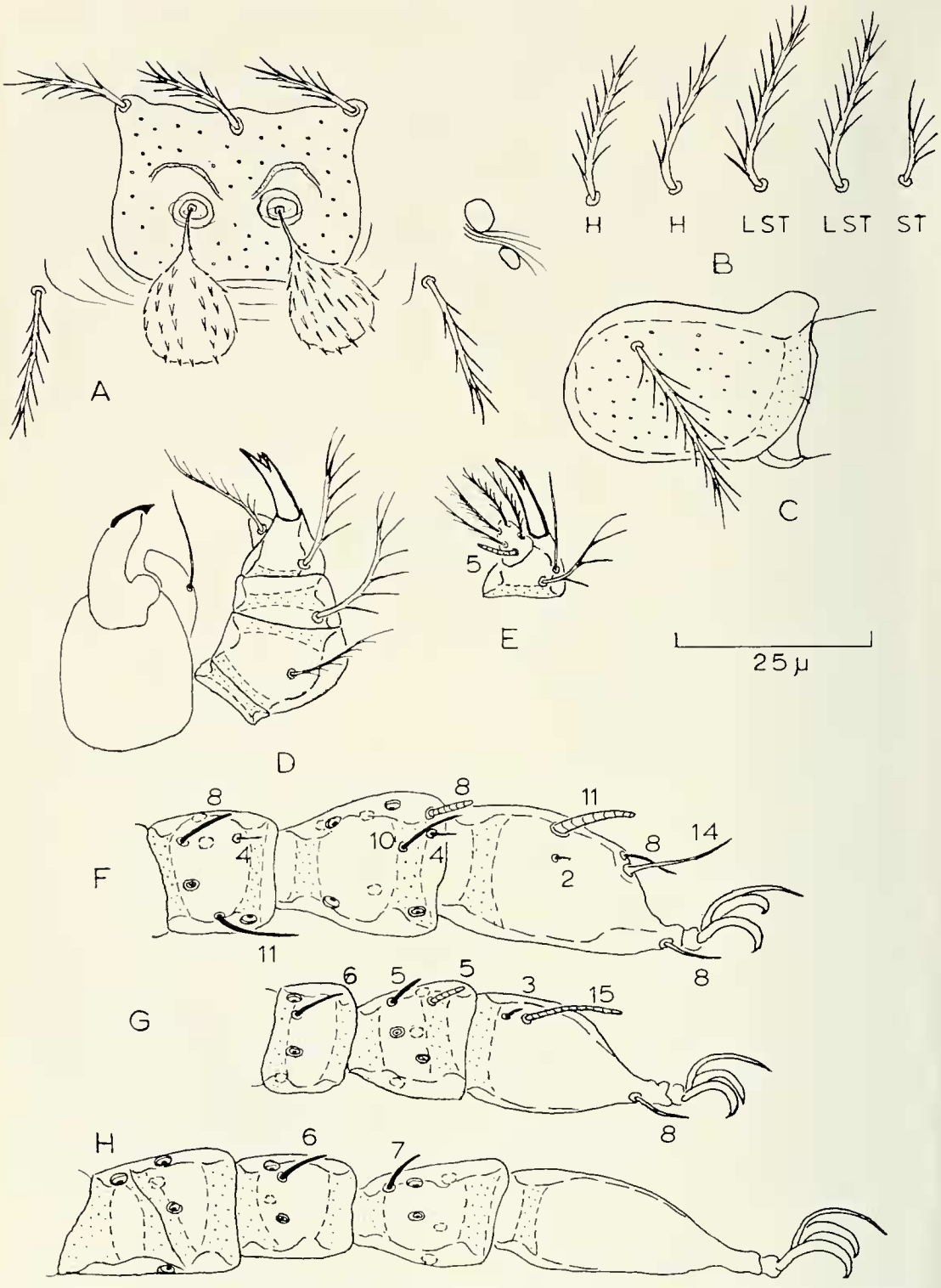

Figure 2. Larva of *Pseudoschoengastia smithi.* A. Scutum and eyes; B. Selected idiosomal setae, H, humerals, LST. lateral sternals, and ST, sternals; C. Coxa III; D. Gnathosoma, dorsal aspect; E. Palpal tibia and tarsus, ventral view; F. Leg I, genu, tibia and tarsus, with nude setae and measurements; G. Leg II, as above; H. Leg III, femur (fused), genu, tibia, and tarsus.

Pseudoschoengastia smithi, new species
Figure 2

Types.—Holotype and 69 paratypes from 13 km SSE Alamos, Rio Cuchujaqui, 274 m, Sonora, Mexico, from 16 *Peromyscus eremicus sinaloensis* Anderson (Cactus Mouse), original number of holotype and 1 paratype, WLH650718-13, taken July 18, 1965 by W. Leon Hunter; and 68 paratypes taken March 27, 1961 (5), April 17, 1962 (6), April 9–11, 1963 (21), July 18, 1965 (30) and Dec. 20, 1966 (6).

Diagnosis.—Larva, in subgenus *Pseudoschoengastia*, with PLs off scutum, and in *farneri* group with 2 genualae, short ALs, and short legs; similar to *P. farneri* Lipovsky in having galeala N, palpal setal formula B/–/BNB, and AL $\leqslant$ AM $<$ PL; and differing from it in having palpal genual seta B.

Description of holotype (with differences among paratypes listed in parentheses).—Idiosoma whitish, elongate, partially engorged 312 × 143; eyes red, 2/2, anterior larger, ocular plate obscure. Dorsal setal formula 4 (humerals) –4 (lateral humerals) –8–10–11–10–10–8–4+33, total 102; humerals 25, lateral humerals 28, 1st posthumerals 15, posterior setae measuring 19. Ventral setal formula 2–2 (sternals) –4 (lateral sternals) –8–8–6–4–2, total 36; 1st sternal 25, 2nd sternal 14, lateral sternal 29, posterior ventral measuring 11. Total idiosomal setae 138.

Scutum: rectangular with posterior margin slightly concave, PLs off scutum; sensilla capitate with barbules of 2 types. Scutal measurements (in parentheses, mean and range of 24 types): AW 31 (33, 31–36), PW 55 (64, 49–83), SB 12 (12, 11–14), ASB 17 (18, 16–20), PSB 12 (13, 11–15), AM 18 (19, 16–22), AL 16 (18, 14–22), PL 22 (24, 22–26), S 23 (23, 20–26, 11).

Gnathosoma: chela with tricuspid cap and ventral tooth; chelobase and capitular sternum punctate; galeala N; palpal setal formula B/B/BNB; palpal tarsus 5B, T (5μ); palpotibial claw trifurcate.

Legs: I, 2 genualae, tarsala 11, sub- and parasubterminala; II, coxa 1B, genuala, 2 tibialae, tarsala 15, pretarsala; III, coxa 1B, genuala, tibiala, no mastisetae. All legs short, segments 7–6–6: I 166, II 143, III 161, total index 470 (481, 442–503 in 23), all legs terminating in 2 claws and clawlike empodium without onychotriches.

Taxonomic remarks.—This is another species of the *farneri* group which is much closer to *P. farneri* Lipovsky (1951) than to the other western North American species such as *P. aeci*, *P. bisetosa*, *P. occidentalis* and *P. pedregalensis*.

Ecological notes.—All larvae were found deep within the external auditory meatus of the ears of *Peromyscus eremicus*. Additional studies should uncover more than the two localities listed below.

Comments.—This species is named for Dr. James Dale Smith, California State University, Fullerton, who has provided us with many chiggers, while at the University of Kansas and since his arrival in California. It also acknowledges his professional editorship of this publication.

Specimens examined (71).—*MEXICO*. SONORA. Type series (70); 16 km E Navojoa, *Peromyscus eremicus*, 19.IV.1962 (1).

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LITERATURE CITED

Brennan, J. M. 1952. The genus *Pseudoschoengastia* Lipovsky, 1951, with the description of two new species and a key to the world species, also *Neoschongastia paenitens*, new name for *Neoschongastia kohlsi* Brennan, 1951, preoccupied. Proc. Ent. Soc. Washington, 54:133–137.

Brennan, J. M. 1965. Five new chiggers from southwestern United States (Acarina: Trombiculidae). J. Parasit., 51:108–113.

Brennan, J. M. and J. T. Reed. 1975. A list of Venezuela chiggers, particularly of small mammalian hosts (Acarina: Trombiculidae). Brigham Young Univ., Sci. Bull., Biol. Ser., 20(1): 45–75.

Geest, J. C. and R. B. Loomis. 1968. Chiggers of the genus *Pseudoschoengastia* (Acarina: Trombiculidae) from Costa Rica. Los Angeles Co. Mus. Contrib. in Sci., (150):1–49.

Lipovsky, L. J. 1951. A new genus of Walchiinae (Acarina, Trombiculidae). J. Kansas Ent. Soc., 24:95–102.

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SECONDARY PALATE FORMATION IN MICROTEIID LIZARDS (TEIIDAE: LACERTILIA)

A secondary palate is well developed in mammals, birds and some reptiles. Many fossil reptiles have a